22. (Amended) The liquid crystal display device according to Claim 19, further comprising:

a backlight for illuminating the display panel from its rear side; and

backlight adjusting means for changing brightness of the backlight according to the first display mode and the second display mode based on the command signal.

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**REMARKS**

This is in response to the non-final Official Action currently outstanding with respect to the above-identified application.

Claims 1-23 were present in this application as of the time of the issuance of the currently outstanding Official Action. Claims 1-23 stand rejected by the Examiner. By the foregoing Amendment, Claims 1, 2, 10, 11, 19 and 22 have been amended. No New Claims have been and no claims have been canceled. Accordingly, upon the entry of the foregoing Amendment, Claims 1-23 will constitute the claims under active prosecution in this application.

A "**VERSION SHOWING CHANGES MADE TO THE CLAIMS**" is attached as required by the Rules.

More specifically, it is noted that in the currently outstanding Official Action, the Examiner has:

1. Acknowledged Applicants' claim for foreign priority under 35 USC 119(a)-(d), and indicated that the required certified copies of the priority document have been received by the United States Patent and Trademark Office.

2. Provided Applicants with a copy of a Notice of References Cited (Form PTO-892) and copies of the references cited therein.

3. Acknowledged Applicants' Information Disclosure Statements by providing Applicants with a copy of the Form PTO-1449 that accompanied each Statement duly signed, dated and initialed by the Examiner to confirm his consideration of the art disclosed therein;

4. Objected to the drawings on the bases that Figs. 8-10, 15, 17 and 22B should be amended so as to be designated by a legend such as "PRIOR ART" since only that which Applicants admit to be old is illustrated therein, and that the drawings as filed fail to show every feature of the invention specified in the claims, i.e., the drawings as filed fail to show (i) "a plurality of latch circuits" and "scan start signal supply means for...supply period" as in Claim 16, lines 7-14; (ii) "the supply control means outputs a control signal for setting the latch circuit number 'm' to ... external" as in Claim 18, lines 5-8; and (iii) "the display control section...operation" as in Claim 19, lines 3-10.

5. Objected to the specification on the grounds that it fails to provide proper antecedent basis for the claimed subject matter, i.e., (i) "the display control section out of operation" as in Claim 19, lines 3-10, (ii) "backlight adjusting means for switching brightness of the backlight between a first display mode and a second display mode according to the command signal" as in Claim 22.

6. Rejected Claims 1, 5, 7, 9, 10, 14 ,19, 20 and 21 under 35 USC 102(b) as being anticipated by the Verhulst reference (U.S. Patent No. 5,627,560).

7. Rejected Claims 2-4, 8, 11 and 15 under 35 USC 102(b) as being anticipated by the so-called "Verhulst II" reference (WO97/31362).

8. Rejected Claims 16-18 under 35 USC 103(a) as being unpatentable over the so-called "Verhulst II" reference (WO97/31362) as applied to Claim 15.

9. Rejected Claims 6 and 13 under 35 USC 103(a) as being unpatentable over the Verhulst reference (U.S. Patent No. 5,627,560) in view of the Crossland reference (U.S. Patent No. 4,655,550).

10. Rejected Claim 12 under 35 USC 103(a) as being unpatentable over the Verhulst reference (U.S. Patent No. 5,627,560) in view of the Okada et al reference (U.S. Patent No. 4,778,260).

11. Rejected Claim 21 under 35 USC 103(a) as being unpatentable over the Verhulst reference (U.S. Patent No. 5,627,560) in view of the Kuga reference (EP Patent No. 0 655 725 A1).

12. Rejected Claim 22 under 35 USC 103(a) as being unpatentable over the Verhulst reference (U.S. Patent No. 5,627,560) in view of the Motomura et al reference (EP Patent No. 0 730 371 A2).

13. Cited certain additional art as being pertinent to Applicants' disclosure, but failed to apply any of that art against any of the presently pending claims.

Further comment in these Remarks regarding items 1-3 and 13 above is not considered to be necessary in these Remarks.

With respect to item 4, Applicants have proposed amendments in the foregoing Request for Drawing Change Approval that, if approved, will conform Figures 8-10, 15, 17 and 22B to the Examiner's requirement that Figures 8-10, 15, 17 and 22B be designated by a legend such as "PRIOR ART".

Applicants also have proposed a change to Figure 4 such that the presence of a representative one of the latch circuits constituting the shift register 41 is shown in phantom in the box labeled "shift register" along with an appropriate lead line and label. A corresponding change to the specification to conform it to the proposed drawing change also is proposed. The text of the specification as filed at page 34, lines 5-13 indicates that the shift register 41 is made up of latch circuits. Accordingly, no new matter is added to this application by the phantom designation of a representative latch circuit within the box labeled "Shift Register" in Figure 4 or the conforming amendment to the specification.

With respect to the other elements of the claims that the Examiner asserts are not present in the drawings thereby requiring either their addition to the drawings or cancellation from the claims, however, Applicants respectfully **traverse** the Examiner's objections to the drawings as filed.

The basis of this traversal is that the "scan start signal supplying means for...supply period" is clearly disclosed in the specification as being part of the display control section 20 (see page 30, line 25 to page 31, line 4) and one of the output lines from the display control section 20 in Fig. 1 is already labeled "scan start signal". Accordingly, unlike the situation regarding the latch circuits constituting the shift register of Fig. 4, Fig. 1 already contains a specific indication of the presence of a scan start signal supplying means in the display section 20. Accordingly, Applicants respectfully submit that the drawings already contain the required showing of the scan start signal generating means and that this showing would be clear to anyone skilled in the art. Accordingly, Applicants respectfully submit that a further more specific showing of this fact in the drawings should be required. A decision withdrawing the Examiner's requirement for a drawing amendment in this regard in response to this communication is respectfully requested.

Similarly, with regard to Claim 18, the supply control means is the display control section 20, the latch circuits are now representatively shown in phantom in Fig. 4 within the shift register 41 with their output lines allowing the location of the mth circuit to be determined by one skilled in the art (see also in this regard the timing charts). Further, "external" in this context is clearly the discriminating circuit 21. Accordingly, Applicants respectfully submit that the portions of claim 18 referenced by the Examiner are already present in the drawings as originally filed. A decision withdrawing the outstanding requirement for amended drawings regarding the elements of Claim 18, therefore, is respectfully requested.

In addition, with respect to Claim 19, the display control section is shown at 20, external is the discriminating circuit 21 and the selector switch is shown at 34, 35. In addition, the phraseology of Claim 19 now has been revised so as to remove any question arising from the use of the phrase "out of operation" in that claim as originally filed. Hence, it is respectfully submitted that the elements of Claim 19 also are already shown in the drawings as originally filed. A decision withdrawing this requirement, therefore, is respectfully requested as well.

Accordingly, the foregoing response is respectfully submitted to be a complete response to the Examiner's objection to the drawings in the currently outstanding Official Action. Approval of the foregoing Request for Drawing Change Approval and withdrawal of the otherwise outstanding objections traversed herein in response to this communication are respectfully requested.

With respect to item 5 above, Applicants respectfully call the Examiner's attention to the foregoing amendments to Claims 19 and 22 as originally filed that are submitted to overcome the Examiner's objection to the specification. In particular, Amended Claim 19 is consistent with the disclosure related to Fig. 2. Thus, the terms "first display mode" and "second display mode" now have been clarified. The first display mode is for displaying dynamic images, i.e., motion pictures such as MPEG (Motion Pictures Experts Group), wherein black display signal is supplied together with data signals in order to improve display quality. The second display mode, on the other hand, is for static images without the supply of black display signal and is the usual pixel driving method. Further, the way brightness of the backlight is adjusted according to the first and second display modes is disclosed as "this embodiment" and "conventional display sequence", respectively, at page 46, line 23 to page 49, line 10 of the present specification. Amended Claim 22 is consistent with this description.

Accordingly, a decision withdrawing the outstanding objections to the specification in the currently outstanding Official Action in response to this communication is respectfully requested.

With regard to item 6 above, Applicants respectfully note that goal of the Verhulst reference is to eliminate the drawback that arises when a ferro-electric liquid crystal material is used in a liquid crystal display device from the fact that a large range of supply voltages are required for the column electrodes (see Column 1, lines 53-66). In order to accomplish this goal, the Verhulst display device includes a drive circuit 15 for alternately presenting a voltage for an auxiliary signal ($V_{reset}$) and a voltage for selection ($V_{comsel}$) to a counter electrode 14 (see, Claim 1; Column 2, lines 1-5 in the specification; and Figures 1 and 5). In other words, as will be seen from Fig. 5, the pixel 2 is reset in a non-selection period (i.e., during $V_{sel}=0$ when its associated TFT 3 is not conductive) by supplying a negative voltage $V_{reset}$ to the counter electrode 14 and grounding ($V_{data}=0$) the column line 4. In addition, the pixel 2 is charged during the selection period (i.e., during $V_{sel}>0$ when its associated TFT 3 is conductive) by supplying a data signal $V_{data}$ to the column line 4 and supplying a positive voltage $V_{comsel}$ greater than $V_{data}$ to the counter electrode 14. The foregoing display driving method is used in Verhulst because the characteristics of the ferro-electric liquid crystal material used (see Abstract) are such that the pixels can be driven only by a negative polarity voltage and can be reset only by a positive neutralizing polarity voltage relative to the counter electrode.

In the above regard, it is respectfully noted that ferro-electric liquid crystal materials were developed and their use started about ten (10) years ago. Ferro-electric liquid crystal materials have a response speed of about $10^2\mu$ seconds which is about 100 times faster than a nematic liquid crystal materials. Note: nematic liquid crystal materials are used in the present invention (see page 40, lines 16-17) and they also are the materials generally used in display devices in recent years.

In contrast to the foregoing, the present invention (see Claim 1) improves a motion picture display grade liquid crystal display device using a nematic liquid crystal material, not a ferro-electric material. Accordingly, it will be understood that the display device of the present invention (see Fig. 1) does not require a voltage supply circuit 15 for the counter electrode 14 such as that shown in Fig. 1 of Verhulst. Therefore, the counter electrode 15 of the present invention may be maintained at the same voltage throughout the image display operation. In addition, the reset operation of Verhulst is never performed in the present invention. Instead, a black display signal is supplied to the column line with specified row lines simultaneously selected. This is clearly shown in Fig. 5 as gate selective pulses during the discriminant signal "H". Moreover, the voltage supplied by the column line via the TFT to the associated pixel electrode corresponds to the data signal (that includes the black display signal) so as to have both a positive value and a negative value with respect to the counter electrode as set forth in claim 1.

The discussion relates to independent Claims 1 and 10 as amended. It is supported at claim 9 and in the specification at page 12, line 22 to page 13, line 16 and at page 52, line 14 to page 53, line 14 in that the voltage of the data signal can have both positive and negative polarities with respect to the potential level of the counter electrode. This driving method is clearly distinct from the driving method disclosed in the Verhulst reference. In particular, it will be understood that the ferro-electric liquid crystal material of the Verhulst reference can be driven only by a data voltage signal having a negative polarity with respect to the counter electrode. Moreover, it will be understood by those skilled in the art that the driving method of the present invention is advantageous for so-called "dot-wise reversal driving" as applied mainly to recent liquid crystal displays because black display voltages of different polarity can be supplied to adjoining pixels and the polarity of the data signal voltage is not one (+or -) but two (+ and -).

Accordingly, Applicants respectfully submit that the currently outstanding rejections based upon the Verhulst reference are in error and should be withdrawn.

With regard to item 7 above, it will be recognized that the goal of the Verhulst II reference is to substantially eliminate the so-called "memory effect". To accomplish this objective, the Verhulst II display device provides the pixels in a first number of successive rows with a reset signal (41 in Fig. 4a) during a first part of the line-selection time ($t_t$ in Fig. 4a), and repeats this in subsequent line-selection times for a second number of successive rows, shifted by at least one line position. Further, the column electrodes are provided with data signals (44 in Fig. 44b) during every second part of the line selection time ($t_w$) by the joint effect of reset signals 41 such that a complete reset achieved (R in Fig. 4c, see page 3, line 29 to page 4, line 2). In other words, the display device alternately performs resetting and data signal writing to the pixel. Note: here "resetting" means making the charge across the pixel (i.e., between the pixel electrode and the counter electrode) zero.

In Verhulst II this resetting just described is indispensable because that reference uses ferro-electric liquid crystal material having a spontaneous polarization characteristic. Hence, if little electric charge remains in the pixel at a data signal writing point in time, the writing become inaccurate with a related worsening of display quality. Therefore, the reset operation is repeatedly performed just before the writing operation as shown in Fig. 4a as a series of reset pulses 41 before the selective pulses for writing 42.

The present invention, as claimed in Claim 2, has the same object as the Verhulst II reference, but it uses the liquid crystal material discussed with respect to claim1 above, i.e., a non-ferro-electric liquid crystal material. Accordingly, the same distinctions as were present between Claim 1 and Verhulst are present between Claim 2 and Verhulst II.

Specifically, the display method of the present invention never performs the reset operation of Verhulst II. Instead, the black display voltage signal, whose potential with respect to the counter electrode is reversible, is supplied to the column line. Further, the writing time point of the black display signal in the present invention is different from that of the Verhulst II reset signal, i.e., it is not just before the writing operation, but rather is sufficiently prior to the writing operation to account for the 100 times slower response speed of the nematic liquid crystal display materials used.

Thus, Applicants respectfully submit that the currently outstanding rejections based upon the Verhulst II reference should be withdrawn, and a decision to that effect is respectfully requested.

Finally, with respect to items 8-12 above, it is respectfully noted that the claims therein rejected are directly or indirectly dependent upon the claims amended and distinguished from the primary Verhulst and Verhulst II references hereinabove. Accordingly, it is respectfully submitted that all of the latter claims are patentable over the cited references for the same reasons as set forth immediately above.

Consequently, for each and all of the foregoing reasons, it is respectfully submitted that Claims 1-23 as they will stand upon the entry of the foregoing amendment are in condition for allowance. Reconsideration of this application and the allowance of Claims 1-23 of this application in response to this communication, therefore, are respectfully requested.

Finally, Applicants believe that additional fees are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. **04-1105**, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

Date: April 16, 2003

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**VERSION SHOWING CHANGES MADE TO CLAIMS**

Additions shown underlined; Deletions shown in brackets.

**IN THE SPECIFICATION:**

**Please amend Page 34, lines 5-13 as follows:**

"Fig. 4 is a schematic block diagram of the gate driver 13. The constitution of the gate driver 13 in the present invention is not limited to this. The gate driver 13 of this embodiment has a shift register 41, an output signals from latch circuits ([not] shown representatively in phantom) constituting this shift register 41 are supplied to an output circuit 42. Then, a gate voltage of "H" level or "L" level is applied to a gate line G by the output circuit 42, by which the gate line G is selected."

**IN THE CLAIMS:**

**Please amend Claims 1, 2, 10, 11, 19 and 22 as follows:**

1. (Amended) A liquid crystal display method for displaying an image to pixels by supplying a data signal to a plurality of column lines arrayed in parallel to one another and by supplying a select signal to a plurality of row lines arrayed in parallel to one another in a direction in which the row lines intersect the column lines, each of the pixels being made up of a pixel electrode connected to a selected one of said plurality of column lines via a TFT, of which a gate is connected to a selected corresponding one of said plurality of row lines, a counter electrode, and a liquid crystal between the pixel electrode and the counter electrode, wherein the pixel electrode is supplied with voltages corresponding to the data signal, and wherein the voltages supplied to the pixel electrode have a positive polarity and a negative polarity with respect to a potential level of the counter electrode during the display of images [the pixels to which the image is displayed being made up of liquid crystals located at intersecting points, or vicinities of the intersecting points, between the column lines to which the data signal is supplied and the row lines to which the select signal is applied], the liquid crystal display method comprising:

a step for supplying the select signal to the nth (where n is a positive integer) row line and also supplying the data signal to the column lines, thereby displaying an image based on the data signal to pixels located at intersecting points between the nth row line and the individual column lines;

a step for next supplying the select signal to the (n+m)th row line[,] [where m is a positive integer ], and also supplying to the column lines a black display signal for displaying a black image to said pixels, thereby displaying the black image to pixels located at the intersecting points between the (n+m)th row line and the individual column lines;

a step for iterating the image display operation based on the data signal and the black image display operation while sequentially shifting the row line to which the select signal is supplied; and

a step for, with a return to the first row line if the (n+m)th row line, to which the select signal is supplied, is beyond the last row line, displaying the image based on the data signal and the black image to all the pixels within one frame period.

2. (Amended) A liquid crystal display method for displaying an image to pixels by supplying a data signal to a plurality of column lines arrayed in parallel with one another and by supplying a select signal to a plurality of row lines arrayed in parallel with one another in a direction in which the row lines intersect the column lines, each of the pixels being made up of a pixel electrode connected to one of said plurality of column lines via a TFT, of which the gate is connected to a corresponding one of said plurality of row lines, a counter electrode, an a liquid crystal between the pixel electrode and the counter electrode, wherein the pixel electrode is supplied with voltages corresponding to the data signal, and wherein the voltages supplied to the pixel electrode have a positive polarity and a negative polarity with respect to a potential level of the counter electrode during the display of images [the pixels to which the image is isplayed being made up of liquid crystals located at intersecting points, or vicinities of intersecting points, between the column lines to which the data signal is supplied and the row lines to which the select signal is supplied], the liquid crystal display method comprising:

a step for supplying the select signal to the nth row line (where n is a positive integer) and also supplying the data signal to the column lines, thereby displaying an image based on the data signal to pixels located at intersecting points between the nth row line and the individual column lines;

a step for next supplying the select signal simultaneously to a plurality of row lines other than the nth row line, and also supplying to the column lines a black display signal for displaying a black image to the pixels, thereby displaying the black image to pixels located at intersecting points between the plurality of row lines and the individual column lines;

a step for iterating the image display operation based on the data signal and the black image display operation while sequentially shifting the row line to which the select signal is supplied; and

a step for, with a return to the first row line if the plurality of row lines, to which the select signal is supplied, are beyond the last row line, displaying the image based on the data signal and the black image to all the pixels within one frame period.

10. (Amended) A liquid crystal display device having:

a display panel in which are formed at least a plurality of column lines arrayed in parallel with one another, a plurality of row lines arrayed in parallel with one another in a direction in which the row lines intersect the column lines, and pixels , each of the pixels being made up of a pixel electrode connected to one of said plurality of column lines via a TFT, of which the gate is connected to a corresponding one of said plurality of row lines, a counter electrode, an a liquid crystal between the pixel electrode and the counter electrode, wherein the pixel electrode is supplied with voltages corresponding to the data signal, and wherein the voltages supplied to the pixel electrode have a positive polarity and a negative polarity with respect to a potential level of the counter electrode during the display of images [made up of liquid crystals located at intersecting points, or vicinities of the intersecting points, between the column lines and the row lines]; a column line driver for supplying a data signal to the column lines; and a row line driver for supplying a select signal to the row lines, the liquid crystal display device comprising:

a display control section for supplying an image signal and a control signal to the column line driver, while supplying a control signal to the row line driver, thereby controlling image display operation to the display panel;

black display signal generating means for generating a black display signal to thereby display a black image to the pixels; and

a selector switch provided in the column line driver and operative for switchedly selecting alternately between a data signal based on an image signal derived from the display control section and a black display signal derived from the black display generating means,

wherein the display control section supplies to the row line driver a control signal for making the row lines sequentially selected, where the select signal is supplied to the nth row line while the data signal is selected by the selector switch, and where the select signal is supplied to the (n+m)row line while the black display signal is selected by the selector switch.

11. (Amended) A liquid crystal display device having:

a display panel in which are formed at least a plurality of column lines arrayed in parallel with one another, a plurality of row lines arrayed in parallel with one another in a direction in which the row lines intersect the column lines, and pixels [made up of liquid crystals located at intersecting points, or vicinities of the intersecting points, between the column lines and the row lines] , each of the pixels being made up of a pixel electrode connected to one of said plurality of column lines via a TFT, of which the gate is connected to a corresponding one of said plurality of row lines, a counter electrode, an a liquid crystal between the pixel electrode and the counter electrode, wherein the pixel electrode is supplied with voltages corresponding to the data signal, and wherein the voltages supplied to the pixel electrode have a positive polarity a and a negative polarity with respect to a potential level of the counter electrode during the display of images, a column line driver for supplying a data signal to the column lines; and a row driver for supplying a select signal to the row lines, the liquid crystal display device comprising:

a display control section for supplying an image signal and a control signal to the column line driver, while supplying a control signal to the row line driver, thereby controlling image display operation to the display panel;

black display signal generating means for generating a black display signal to thereby display a black image to the pixels; and

a selector switch provided in the column line driver and operative for switchedly selecting alternately between a data signal based on an image signal derived from the display control section and a black display signal derived from the black display generating means,

wherein the display control section supplies to the row line driver the control signal for making the row lines sequentially selected, where the select signal is supplied to the nth row line while the data signal is selected by the selector switch, and where the select signal is supplied to the plurality of row lines other than the nth row line while the black display signal is selected by the selector switch.

19. (Amended) The liquid crystal display device according to Claim 10, wherein

the display control section, in response to a command signal from external, selectively outputs a control signal to set the selector switch so as to supply the black signal for a first display mode [in which a black display signal supply operation based on an operation performed by the selector switch is performed], or a control signal to set the selector switch so as to supply the data signal for a second display mode [in which a black display signal supply operation is not performed with the selector switch out of operation].

22. (Amended) The liquid crystal display device according to Claim 19, further comprising:

a backlight for illuminating the display panel from its rear side; and

backlight adjusting means for [switching] changing brightness of the backlight [between] according to the first display mode and the second display mode [according to] based on the command signal.